Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **River Protection** Print Date: **3/9/2000**

Site Summary Level: **Office of River Protection** HQ ID: **0387**

Project **RL-TW05 / Process Waste Support**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

Purpose: The mission of the TWRS Waste Processing Project, of which Process Waste Support is a part, is to provide for pretreatment and immobilization of the radioactive waste stored in 177 underground single and double shell tanks at the Hanford Site. The High-Level Waste (HLW) fraction of the waste will be vitrified and sealed in canisters that can be temporarily stored onsite until shipped to a geologic repository for disposal. The Low-Level Waste (LLW) fraction will be immobilized and sealed in containers suitable for permanent near-surface disposal at Hanford.

To accomplish this mission, the Waste Processing Project will implement a two-phased procurement strategy. Phase I will be the proof-of-concept phase during which a vitrification contractor will design, construct, and operate immobilization facilities to treat approximately 10% of the tank waste, using funding from the private sector. The U.S. Department of Energy (DOE) will pay the vitrification contractor for waste treatment services in accordance with contract DE-AC06-96RL13308. Phase I is scheduled to be completed by 2018. During Phase I the Process Waste Support Project will have the responsibility to administer and integrate the privatization contract, and provide for the interface between PHMC and the vitrification contractor. Phase II is envisioned to be the full-scale production phase, in which the facilities will be configured so all of the remaining waste can be processed. The objectives of Phase II would be to: implement the lessons learned from Phase I; process all tank waste into forms suitable for final disposal; achieve price competition and cost savings throughout the Phase II effort; and meet or exceed the TPA benchmark performance milestones, at which time all HLW will have been immobilized and placed in interim storage until a repository is available for final disposal and all LLW will be immobilized and disposed of on-site. The Process Waste Support Project will have the responsibility to develop any Requests for Proposals and award, administer, and integrate the vendor contracts for retrieving, pretreating, and processing both LLW and HLW.

In accomplishing the TWRS Waste Processing scope, the Process Waste Support effort is responsible for the technical and management integration of the DOE-BNFL-PHMC interface. This includes the preparation and negotiation of interface control agreements, the development of management systems for mapping requirements, maintaining schedules and tracking actions occurring between contractors and DOE, review and comment of privatization deliverables.

Scope: During Phase 1 the Process Waste Support Project is responsible for the following scope:

1. Evaluate private contractors technical and financial proposals and assist DOE in selecting one or more contractors to proceed with design and construction of LAW and HLW proof-of-concept processing plants.

2. Negotiate, award, and administer the contract(s) for the design/operate phase

3. Integrate the contractors operations with the rest of the Hanford Site. Define interfaces with the contractors.

During Phase II the Process Waste Support Project will be responsible for the following scope:

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1. Perform the decision analyses required to define the performance, product and infrastructure requirements for the privatization of retrieval, pretreatment and immobilization of the remaining tank waste.

2. Perform the same functions as in Phase I

This project depends on the Process Waste Privatization Projects (RL-TW06 and RL-TW07) and the Process Waste Privatization Infrastructure Project (RL-TW08) to provide payments to the vendors and construction/operation of the required infrastructure.

The WBS for the Process Waste Support Project includes M & I vendor interface, Phase I Program Management and Phase II Program Management.

Technical Approach: The technical approach and technology initiatives for the Project to accomplish the Hanford Strategic Plan end point targets are identified below.

· Technical Approach - Process Waste Support: The baseline technical approach for the Process Waste Support Project during Phase I is
1. Jointly, with DOE and BNFL, define the interfaces between the PHMC and the private contractor,
2. Actively participates in the IPT's that prepare ICDs between the PHMC and the private contractor,
3. Track and manage compliance with the contractual and ICD baseline,
4. Assist DOE in the evaluation of private contractor products, and
5. As requested by DOE, enter into joint engineering studies with the private contractor, when the studies impact both sides of the interface.

The Phase II technical approach will:

1. Rely on private contractors to retrieve and transfer the remaining tank waste to private processing plants

2. Require the LLW contractor to perform in-plant treatment and separation of the waste into low and high activity fractions which will then be immobilized.

3. Require the HLW contractor to process the Cs/Sr capsules along with the HLW fraction of the tank waste.

This technical approach will require the following EM-50 funded technology development/ demonstration efforts:
1. Advanced methods for achieving LLW volume minimization

2. ILAW product acceptance inspection and test methods

3. IHLW product acceptance inspection and test methods

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Project Description Narratives

Project Status in FY 2006:

The Process Waste Support Project will have established procedures for administering the specific private contractor interfaces, and integrated the vendor's effort with the rest of TWRS. The private contractor will have started pretreatment processing and hot testing of the high-level waste vitrification facility. The immobilized low activity waste vitrification facility will have completed construction.

Post-2006 Project Scope:

The concept of using private capital and expertise for facility construction and then paying the vendors for waste treatment services will have been demonstrated.

Through analysis and trade studies, the performance and infrastructure requirements for Phase II will have been defined. Decisions will have made on retrieval, sludge washing, feed staging and process requirements that will be incorporated into RFP's for Phase II. Phase II contracts for full-scale retrieval, pretreatment and immobilization will have been awarded and design work will have begun.

Project End State

1. By 2028 all retrievable waste in the 177 underground waste storage tanks (99% of the tank waste) will have been removed, transferred to processing facilities and separated into low and high activity fractions leaving the waste tanks ready for closure.

2. The LLW fraction will be processed into 442,000 MT of immobilized LAW suitable for permanent near-surface disposal on the Hanford site.

3. The HLW fraction will be processed into approximately 14000 cubic meters of immobilized HLW suitable for interim storage on the Hanford site and eventual permanent disposal in a geologic repository.

4. The Cs/Sr capsules, currently in storage at WESF, will have been processed into a form suitable for permanent disposal at a geologic repository.

5. All waste processing facilities will be decontaminated and decommissioned and turned over to the Environmental Restoration program for final disposition.

The privatization contract is closed out. All interfaces between the vitrification contractor and the rest of TWRS have been completed.

Specific work activities to close the facilities under this Project to be performed by others at the end of this Project's mission are identified below.

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Project **RL-TW05 / Process Waste Support**

Project Description Narratives

LAW Treatment Facility, Phase II
Work associated with facility performed by Privatization Phase II:
Treat & Immobilize LAW, Phase II
Maintain Safe & Compliant LAW Treatment Facility, Phase II in CP Areas
Transition LAW Treatment Facility, Phase II
Decontaminate and Decommission (D&D) LAW Treatment Facility, Phase II
HLW Treatment Facility, Phase II
Work associated with facility performed by Privatization Phase II:
Treat & Immobilize HLW, Phase II
Maintain Safe & Compliant HLW Treatment Facility, Phase II in CP Areas
Transition HLW Treatment Facility, Phase II
Decontaminate and Decommission (D&D) HLW Treatment Facility, Phase II

Specific work activities to close the facilities under this Project to be performed by others at the end of this Project's mission are identified below.

Cost Baseline Comments:

Estimates supporting the Tank Waste Remediation Systems (TWRS) fiscal year (FY) 2001 Project Baseline Summaries (PBS) estimate were developed using Activity-Based Cost (ABC) estimating methodology consistent with the "Hanford Cost Estimating and Scheduling Guide," DOE/RL-97-90, Revision 0.

The TWRS (FY) 2001 PBS is a product of the development of the technical scope, schedule and cost baselines. The scope, schedule and cost baselines are interrelated and have been integrated. The Hanford Site Technical Baseline requirements have been incorporated in the TWRS Technical Baseline through development of TWRS technical specifications. Level 0 and Level 1 work logics were developed to define the activities and interfaces necessary to meet the technical requirements. For much of the TWRS work, Technical Basis Review (TBR) data packages were then prepared to decompose the Level 1 activities to a detailed, executable task level and document scope and resources necessary to complete the work. Activities and resources from the TBRs were input to Primavera (P3) to prepare the TWRS detailed baseline schedule. Pricing of the estimate was performed in P3 using standard rates and factors developed by the FDH Chief Financial Officer and approved by DOE for forward pricing purposes. The resource-loaded schedules are traceable to the TBR data packages. Costs generated by P3 were developed using the DOE-approved planning rates and were manually escalated using the DOE-approved escalation rates.

Due to significant variations in the current phases of the TWRS projects and available data and scope definition, many estimating techniques have been utilized in development of the cost estimate. They include definitive, parametric, analogy, trend analysis, level of effort and engineering judgement. ABC estimates for the scope of work have been prepared at the lowest level of detail practical. As expected, the level of scope definition and estimate detail is greatest for the near-term activities and less well defined in later years. Through the annual planning process and change control,

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Project **RL-TW05 / Process Waste Support**

Project Description Narratives

the execution year and outyear estimate basis will continue to be refined, updated and validated.

The Estimate Basis is contained in numerous technical scope, schedule and cost baseline and supporting documents including TBR data packages.

Safety & Health Hazards:

There are no hazards related to the Process Waste Support Project. This project is responsible for program management, administration, and the integration of TWRS Disposal Privatization activities with existing TWRS M&I activities.

Safety & Health Work Performance:

PBS Comments:

Private contractors will invest non-government funds to design, construct, operate, and deactivate the retrieval and waste processing facilities. Incentives will be offered by the DOE to the contractors to reduce immobilized waste volumes and to optimize waste loadings. The costs associated with such efforts will ultimately be borne by the DOE through payments to contractors for their products. This approach was developed with input from, and has the support of the Hanford Advisory Board, Regulators, the Indian Nations, and other stakeholders.

Baseline Validation Narrative:

The project cost baseline was reviewed by FM-20 in May 1996. The recommended changes were incorporated into the FY 1997 MYPP.

General PBS Information

Project Validated? **Date Validated:**

Has Headquarters reviewed and approved project? Yes

Date Project was Added: 12/1/1997

Baseline Submission Date:

FEDPLAN Project? Yes

Drivers:

CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
	Y					Y	Y

Project Identification Information

DOE Project Manager: W. J. Taylor

DOE Project Manager Phone Number: 509-372-3864

DOE Project Manager Fax Number: 509-373-0628

Project Baseline Summary Report

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Project **RL-TW05 / Process Waste Support**

General PBS Information

DOE Project Manager e-mail address: william_j_taylor@rl.gov

Is this a High Visibility Project (Y/N): Y

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	142,650	368,944	511,594	6,025	5,352	9,615	9,020	8,100	10,241	12,152	19,332	19,933	20,289	18,404	18,559
PBS Baseline (constant 1999 dollars)	132,167	249,375	381,542	6,025	5,352	9,615	9,020	8,100	10,030	11,646	18,128	18,289	18,215	16,167	15,952
PBS EM Baseline (current year dollars)	142,650	368,944	511,594	6,025	5,352	9,615	9,020	8,100	10,241	12,152	19,332	19,933	20,289	18,404	18,559
PBS EM Baseline (constant 1999 dollars)	132,167	249,375	381,542	6,025	5,352	9,615	9,020	8,100	10,030	11,646	18,128	18,289	18,215	16,167	15,952

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	18,988	17,709	18,098	18,496	85,290	73,953	82,434	53,976	0	0	0	0				
PBS Baseline (constant 1999 dollars)	15,970	14,573	14,573	14,573	62,981	48,980	48,967	28,758	0	0	0	0				
PBS EM Baseline (current year dollars)	18,988	17,709	18,098	18,496	85,290	73,953	82,434	53,976	0	0	0	0				
PBS EM Baseline (constant 1999 dollars)	15,970	14,573	14,573	14,573	62,981	48,980	48,967	28,758	0	0	0	0				

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Project **RL-TW05 / Process Waste Support**

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.10%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%				

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 9/30/2028

Current Projected End Date of Project: 9/30/2028

Explanation of Project Completion Date Difference (if applicable):

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	787,768	**Actual 1997 Cost:**	5,352	**Actual 1998 Cost:**	9,020
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	773,396	**Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):**			20,882
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	794,278				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):		
Cost Growth Associated with Scope Previously Reported (+):		
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	794,278	

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Project **RL-TW05 / Process Waste Support**

Project Reconciliation

Additional Amount to Reconcile (+):	-428,376
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	**365,902**

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
TREATMENT AND/OR REPACKAGING OF ALL REMAINING CS/SR (M-92-05)	T05-03-191	6/30/2003	6/30/2003	6/30/2003	3/29/2002		Y				
Begin Process Waste Support Project	PBS-97-005		2/28/1997								
PBS Mission Completion	PBS-MC-005		9/30/2028								
PBS Project End	PBS-PE-005		9/30/2028								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
TREATMENT AND/OR REPACKAGING OF ALL REMAINING CS/SR (M-92-05)	T05-03-191										Inclusion of Hanford Site Cs/Sr ATreatment and/or Repackaging Parameters in DOE TWRS Phase II Request for Proposal. (Treatment and/or Repackaging of all Remaining Cs/Sr.)
Begin Process Waste Support Project	PBS-97-005			Y							Administrative input to document the start of this PBS.
PBS Mission Completion	PBS-MC-005					Y					Administrative input to document the mission comletion of this PBS.
PBS Project End	PBS-PE-005				Y						Administrative input to document the project end of this PBS.

Performance Measure Metrics

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Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planne 200
Tech.														
Deployed	Ntd	6.00	0.00	6.00							4.00	2.00		

Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035
Tech.													
Deployed	Ntd												

Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total
Tech.										
Deployed	Ntd									6.00

Technology Needs

Site Need Code: RL-WT024

Site Need Name: Enhanced Sludge Washing Process Data

Focus Area Work Package ID: WT-11-01

Focus Area Work Package: Constituent Separation and Analysis

Focus Area: TFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Cost

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate
Sludge Washing		
Sludge Washing		

Technology Needs

Related CCP Milestones	Related Waste Streams	Agree?	Change?
	02113: HLW-20 - Sludge, Salt, Liquid	Y	N

Site Need Code: RL-WT06

Site Need Name: Identification and Management of Problem Constituents for HLW Vitrification

Focus Area Work Package ID: WT-06-01 **Focus Area Work Package:** Enhanced Immobilization Productivity

Focus Area: TFA **Agree with Technology Link:** Y

Benefits (Cost, Risk Reduction, Both): Cost

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate
High Activity Waste Forms and Processes		

Related CCP Milestones	Related Waste Streams	Agree?	Change?
	02113: HLW-20 - Sludge, Salt, Liquid	Y	N

Site Need Code: RL-WT09

Site Need Name: Representative Sampling and Associated Analysis to Support Operations and Disposal

Focus Area Work Package ID: WT-01-01 **Focus Area Work Package:** Transfer Line/Unplugging/Feed Analysis

Focus Area: TFA **Agree with Technology Link:** Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate
Variable Depth Fluidic Sampler		
At-Tank Sampling for High-Level Waste		

Related CCP Milestones	Related Waste Streams	Agree?	Change?
	02113: HLW-20 - Sludge, Salt, Liquid	Y	N

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Technology Needs

Site Need Code: RL-WT015

Site Need Name: Standard Method for Determining Waste Form Release Rate

Focus Area Work Package ID: WT-07-01 **Focus Area Work Package:** Acceptance Criteria and Canister Storage

Focus Area: TFA **Agree with Technology Link:** N

Benefits (Cost, Risk Reduction, Both): Cost

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate

Site Need Code: RL-WT065

Site Need Name: Direct Inorganic and Organic Analyses of High-Level Waste

Focus Area Work Package ID: WT-11-01 **Focus Area Work Package:** Constituent Separation and Analysis

Focus Area: TFA **Agree with Technology Link:** Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate

Related CCP Milestones	Related Waste Streams	Agree?	Change?
	02113: HLW-20 - Sludge, Salt, Liquid	Y	N

Technology Deployments

	Deployment Year		
Deployment Status	Planned	Forecast	Actual Date

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Technology Deployments

		Deployment Year		
Deployment Status		**Planned**	**Forecast**	**Actual Date**
Technology Name:	Laser Ablation/Mass Spectroscopy (LA/MS)			
Potential Deployment		2001		
Technology Name:	Sludge Washing			
Potential Deployment		2002		
Technology Name:	High Activity Waste Forms and Processes			
Potential Deployment		2002		
Technology Name:	Variable Depth Fluidic Sampler			
Potential Deployment		2001		
Technology Name:	At-Tank Sampling for High-Level Waste			
Potential Deployment		2001		
Technology Name:	Clean Salt			
Potential Deployment		2001		